

"APPROVED FOR RELEASE: Thursday, July 27, 2000

CIA-RDP86-00513R00041212

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CIA-RDP86-00513R00041212(

L 3655-66

ACCESSION NR: AT5024877

graphite, mercury), thus leading to excessive losses of electric energy, over-heating of the contacts, and other complications, it is expedient to replace them with coatings of some at least equally corrosion-resistant, but more electro-conducting compounds (of the carbide, boride, and nitride types). In this connection, the technique of deposition also matters. Research and development work on the selection of compounds assuring a minimal voltage drop, and on the optimal techniques of their deposition, is already in progress. This problem is particularly important to the chlorine industry, where, chlorine electrolysis involves a highly aggressive medium and where a still greater problem is that of developing an insoluble anode to replace the troublesome graphite anode. Research into new, more effective anode materials is in progress. Thus, Soviet scientists have started laboratory tests of specimens of different refractory materials resistant to aggressive media: the carbides of Ti, Zr, Cr, Mo, W, carbidized Ti; the borides of Ti, Zr, Cr, boronized Ti; the nitrides of Ti, Zr, Cr, nitrided Ti; and molybdenum silicide. These studies have not yet produced the desired results, but this is no reason for discontinuing them, as proved by the recent publication of two patents (Ioffe, A. F. Fizika poluprovodnikov, Moscow, Izd-vo AN SSSR, 1957; Beet, H. Canadian Patent No. 643672, 1962) pertaining to a corrosion-resistant electrode used as an anode in electrolysis and consisting of a metal (Ti, Cr, Nb)

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or its alloy coated with an electroconducting metal nitride. Orig. art. has:
2 figures, 1 table. *44.55*

ASSOCIATION: Institute of Problems in Materials Science, AN UkrSSR (Institut problem
materialovedeniya, AN UkrSSR)

SUBMITTED: 06Aug65

ENCL: 00

SUB CODE: MM, GC

NO REF SOV: 005

OTHER: 005

PC
Card 3/3

L 3656-66 EWP(e)/EWT(m)/EWP(w)/EPP(c)/EWP(l)/ETC/EPF(n)=2/ENG(m)/T/ENP(t)/EAP(b)

ACCESSION NR: AT5024878 EWA(c) IJP(c) 92
JD/NW/JG/DJ/GS/AT/NH UR/0000/65/000/000/0127/0142 87

AUTHOR: Epik, A. P.; Bovkun, G. A.; Golubchik, I. V.; Sinitsina, L. P. 87/

TITLE: Certain properties of carbide and boride diffusion coatings on refractory metals

SOURCE: AN UkrSSR. Institut problem materialovedeniya. Diffuzionnyye pokrytiya na metallakh (Diffusion coatings on metals). Kiev, Naukova dumka, 1965, 127-142

TOPIC TAGS: metal diffusion plating, refractory metal, boride, carbide, corrosion resistance, wear resistance, metal scaling

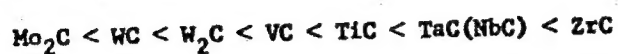
ABSTRACT: Since the physicochemical properties of the diffusion coatings of refractory metals still remain relatively uninvestigated, the authors investigated the scale resistance, wear resistance, and chemical resistance of the carbide and boride diffusion coatings on Ti, Zr, Mo, and W as well as of the boride coatings of Nb. The boride coatings on Ti, Zr, Nb, Mo, and W represented the phases TiB_2 , ZrB_2 , NbB_2 , $Mo_2B + Mo_2B_5$, and $W_2B + W_2B_5$, and the carbide coatings, correspondingly, the phases TiC , ZrC , Mo_2C , and $W_2C + WC$. Tests of the scale resistance of

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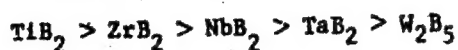
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the carbides of these refractory metals at oxidation temperatures of 600-1000°C showed that their scale resistance increases in the following order



For the borides, this sequence is as follows



with the borides being generally more scale-resistant than the carbides. Wear-resistance tests, in their turn, based on friction against a rigidly affixed rotating piece of sandpaper, showed that the boridized specimens are more wear-resistant than the carbidized specimens, and that both types of specimens are many times more wear-resistant than the refractory base metal. Measurements of the microhardness of the diffusion coatings showed that it approximates the microhardness of the corresponding phases of the stoichiometric composition. Finally, chemical-resistance tests of the specimens, as based on the authors' tests of corrosion resistance in hydrochloric, sulfuric, nitric, and phosphoric acids, as

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well as in alkalis, showed that carbidized W is the most wear-resistant, as it virtually does not interact with nitric, sulfuric, and phosphoric acids, while it only weakly interacts with alkali solutions. Of the boronized specimens, boronized W and Mo are the most corrosion-resistant. These investigations are only in their initial stage, and they will be continued. Orig. art. has: 2 figures, 5 tables.

ASSOCIATION: Institute of Problems in Materials Science, AN UkrSSR (Institut problem materialovedeniya, AN UkrSSR)

SUBMITTED: 06Aug65

ENCL: 00

SUB CODE: MM, IC, GC

NO REF SOV: 025

OTHER: 007

PC

Card 3/3

ACC NR AM5001717

Monograph

UR/

Samsonov, Grigoriy Valentinovich; Epik, Aleksey Pavlovich

Coatings from refractory compounds (Pokrytiya iz tugoplavikh soyedineniy) Moscow, Izd-vo "Metallurgiya", 1964. 107 p. illus., biblio. Errata slip inserted. 3060 copies printed.

TOPIC TAGS: coating, metal coating, refractory compound, refractory compound coating

PURPOSE and COVERAGE: This book is intended for engineering personnel of machine-building, metallurgical, chemical and other branches of industry. It may also be useful to designers and planners. It summarizes Soviet and non-Soviet information on coating metals, alloys and graphite with refractory compounds, protecting these materials against high-temperature oxidation, and increasing their hardness, refractory properties, and resistance to erosion and corrosion. Methods and procedures of obtaining protective coatings, such as simple and complex boride, carbide, nitride, and silicide phases, on refractory metals are reviewed. Examples of using coatings made of refractory compounds in various engineering fields are given, and the properties of these coatings are discussed.

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UDC621.793:669.018.4

ACC NR: AM5001717

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SUB CODE: 13/ SUBM DATE: 26Oct63/ ORIG REF: 083/ OTH REF: 050/

Card 2/2

EPIK, E. Y., SHVETS, Y. T., DYBAN, E. P., STRADOMSKIY, M. V.

"Experimental investigation of Flow Turbulence on Heat Transfer
at Air Motion in Tubes."

Report submitted for the Conference on Heat and Mass Transfer,
Minsk, BSSR, June 1961.

8/021/61/000/005/012/012
D215/D304

AUTHORS: Shvets', I.T., Member of AS UkrSSR, Dyban, Ye.P.,
Stradoms'kyi, M.V., Rudkin, S.K., and Epik, E.Ya.

TITLE: Investigating radial components of velocity pulsation
during the motion of air in short pipes

PERIODICAL: Akademiya nauk Ukrayins'koyi RSR. Dopovid1, no. 5,
1961, 644 - 648

TEXT: The ratio of these pulsations to mean velocity is usually
considered as degree of turbulence (the so-called Karman number)
where $\sqrt{(w_r')^2}$ is the mean square value of the radial component of

velocity pulsation, w_0 the mean velocity of streaming, with res-
pect to the cross section of the pipe. The experiments were made on
a seamless, hydraulically smooth pipe with inner diameter of 51 and
length of 4000 mm. To increase initial disturbances, special tur-
bulizators were put before the pipe, in the form of perforated pla-
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Investigating radial components ...

S/021/61/000/005/012/012
D215/D304

tees and gratings having different diameters of openings and different coefficients β (ratio of free passage to total area). Measurements of magnitude of the pulsations were made according to the thermoanemometric method with the aid of ETA-5A set of instruments. The sensitive element was a V-shaped pickup connected with two adjacent arms of the measuring bridge. Pulsations were measured at seven longitudinal sections of the pipe and at seven points within each section. The type of variation shown here was found to be valid for all turbulizators, without any exception, also for a stream of air in a pipe without artificial disturbances. It can be assumed that the part of the pipe where the radial component of velocity pulsation is variable, is the zone of hydrodynamical stabilization of the stream. The relative length of this zone depends on geometrical characteristics of the turbulizator. Practically only one turbulizator among those tested had corresponding zone of stabilization longer than 30 diameters. Two other turbulizators were intended for calming and are not considered. The value of K_r can be found, with possible error up to 10 %, from

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$$K_{r_{ser}} = \frac{210}{Re^{0.5}} \quad (2)$$

($K_{r_{ser}}$ is the mean value of K_r with respect to cross section of the pipe). The absolute value of the radial component of pulsation is

$$\sqrt{W_r^2} = 6,45 \cdot 10^{-4} Re^{0.5}. \quad (3)$$

The attempt to find an empirical formula for the radial component of pulsation with respect to the length of stabilization zone has failed. The authors find that the determination of the radial component of pulsation alone is insufficient for the characterization of the stream in the initial zone of the pipe. There are 3 figures. ✓

ASSOCIATION: Instytut teploenerhetyky AN URSR (Institute of Heat-power Engineering, AS UkrSSR)

SUBMITTED: February 1, 1960

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25350

S/021/61/000/007/008/011

D205/D306

26.5200

AUTHORS: Shvets', I.T., Member AS UkrSSR, Dyban, E.P.,
Stradoms'kyi, M.V., Rudkin, S.K., and Epik, E.Ya.

TITLE: Effect of the level of initial disturbances on the
heat exchange intensity during turbulent air flow in
short pipes

PERIODICAL: Akademiya nauk Ukrayins'koyi RSR, Dopovidi, no. 7,
1961, 920 - 923

TEXT: In calculations involving short heat exchange surfaces it is
essential to take into account the effect of the air stream initial
turbulence on the value of heat exchange coefficients. The authors
studied the effects of pipe lengths, stream conditions and that of
initial disturbances level on heat exchange intensity in pipes less
than 80 diameters long [Abstractor's note: This expression probably
means the ratio: length/diameter]. The lower pipe partition was
heated to 150°C by electricity. The temperature was measured by

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S/021/61/000/007/008/011

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Effect of the level ...

means of thermocouples and the air temperature with a specific device, also previously described. The criterial equation $Nu = f(Re)$ as well as the obtained experimental data proves that the physical flow conditions along the pipe length have less effect on the Nu value than on the heat exchange coefficient (beyond the latter stabilization level). Therefore, in evaluating experimental data -- the pipe length influence on the average values of heat exchange coefficient, as well as that of the distance of the examined pipe partition from the pipe mouth, (for local data), the coefficient E_s was used, which is the ratio of Nusselt's number for the given pipe part and that for part remote from the air entrance. Investigation of heat exchange intensity with turbulent flow, without artificial turbulizers, proved that this intensity might be expressed (for pipe partitions beyond the stabilization level) by the following equation: $Nu_p = 0.018 Re^{0.8}$, which is in agreement with the well known generalization. During that kind of air flow, a laminar flow zone existed for the whole range of the studied Re values (up to $Re = 5 \cdot 10^4$). Behind that zone a transitory zone was observed,

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D205/D306

Effect of the level ...

the length of which is inversely proportional to Re values (Fig.1). This leads to corresponding changes in the local Nusselt's numbers. By graphs illustrating the changes of the coefficient Ee along the pipe length, the local Nu numbers as well as the average ones' can be calculated (as long as parameters on the tube entrance are constant). When artificial turbulence devices are used the air flow characteristics change, but the zone of initial artificial perturbations does not exceed 30 diameters of the pipe length, even for the most effective turbulizer. As a result of increased local heat exchange coefficient in the first pipe partition, their average values are increased along a large stretch of pipe length and are inversely proportional to Reynold's numbers; so the average increase of Nusselt's number with the most effective turbulizer (one opening 10 mm in diameter, $\beta = 0.038$) was observed on the pipe length equalling about 600 diameters when Re was equal to $5 \cdot 10^4$, but on a length of 75 diameters only when $Re = 1.5 \cdot 10^6$. It follows that for evaluation of heat exchange data in the entrance part of a pipe heated by an air flow with natural as well as artificial turbulence it is necessary to make a correction on the pipe length: $Ee =$

X

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Effect of the level ...

S/021/61/000/007/008/011
D205/D306

Nu/Nu_p. There are 3 figures and 3 references: 2 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Institut teploenergetiki AN URSR (Institute of Thermo-energetics AS UkrSSR)

SUBMITTED: February 1, 1961

Card 4/5

DYBAN, Ye.P.; RUDKIN, S.K.; STRADOMSKIY, M.V.; SHVETS, I.T.; EPIK, E.Ya.

Investigation of the radial component of velocity pulsations in a turbulent air flow in relatively short tubes with different levels of initial perturbation. Inzh.-fiz.zhur. 4 no.11:3-9 N '61.
(MIRA 14:10)

1. Institut teploenergetiki AN USSR, g. Kiev.
(Aerodynamics)

EPIK, I.P. [Õpik, I.P.], kand.tekhn.nauk

Heating surface fouling in boilers burning Estonian oil shale. Elek.
sta. 29 no.2:24-29 F '58. (MIRA 11:3)
(Boilers--Incrustations) (Oil shales)

SOV/112-59-5-8540

8(6), 14(6)

Translation from: Referativnyy zhurnal. Elektrotehnika, 1959, Nr 5, p 21 (USSR)

AUTHOR: Epik, I. P., and Mikk, I. R.

TITLE: Mechanism of Formation of Solid Fly-Ash Deposits on Convective Heating Surfaces

PERIODICAL: Izv. vyssh. uchebn. zavedeniy. Energetika, 1958, Nr 3, pp 58-64

ABSTRACT: Apart from ash slagging and cementation due to sweating of cold surfaces, there are two major types of deposits of fly ash on convective heating surfaces: powdery deposits (on the tail tube parts, or at low gas rates on both front and tail parts) and solid deposits on the front tube parts. The powdery deposits assume definite size depending on the by-passing gas and are easily removable. The solid deposits, in burning Estonian shales, are observed in the 500-900°C gas zone; they consist of calcium sulfate, and require boiler shutdown for their removal. Depending on the gas velocity, the deposits can be broken down into three groups: (1) with a gas velocity under

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SOV/112-59-5-8540

Mechanism of Formation of Solid Fly-Ash Deposits on Convective Heating Surfaces

6 m/sec, large quantities of powdery deposits occur; (2) with gas velocities of 6-20 m/sec, the ash wearing effect precludes powdery deposits on the front side; only chemically active particles forming solid stony materials are deposited there; (3) with gas velocity over 20 m/sec, no petrescence is formed because the ash wearing effect is so high that it precludes this type of deposit entirely. These factors influence the formation of petrescences: (1) chemical factors, gas velocity; (2) the nature of the stream boundary layer (gas flowing by longitudinally or transversely), the fractional composition and concentration of the fly ash. Thus, in the solid-deposit zone, the tubes with a transverse by-flowing are unreliable and must be replaced with a longitudinally by-flowing surface or with a surface having a low cross factor.

B.I.L.

Card 2/2

EPK, I.P.

EPK, I.P., kand.tekhn.nauk dots.

Heat resistance of solid flash deposits in pipes in connection
with combined lateral-longitudinal washing. Izv.vys.ucheb.
sav.; energ. 2 no.8:71-74 Ag '59. (MIRA 13:2)

1. Tallinskiy politekhnicheskiy institut. Predstavlena kafedroy
teploenergetiki.
(Boilers--Incrustations)

EPIK, I.P., kand.tekhn.nauk.dots.; MIKK, I.R., kand.tekhn.nauk;
RATNIK, B.Ya., inzh.

Calculating heat transfer of semiradiating screenlike
heating surfaces. Izv.vys.ucheb.zav.; energ. 3 no.3:
63-70 Mr '60. (MIRA 13:3)

1. Tallinskiy politekhnicheskiy institut. Predstavlena kafedroy
teploenergetiki.
(Heat--Radiation and absorption)

EPIK, Il'mar Pavlovich [Opik, Ilmar]; ANSON, P., red.; VAKHTRE, I.
[Vahtre, I.], tekhn. red.

[Effect of the mineral parts of oil shale on the working
conditions of the boiler unit] Vliianie mineral'noi chasti
slantsev na uslovia raboty kotloagregata. Tallinn, Eston-
skoe gos. izd-vo, 1961. 248 p. (MIRA 15:3)
(Boilers—Firing) (Oil shales)

10 4100

11 9300

23753

S/170/61/004/006/008/015
B129/B212

AUTHORS: Mikk, I. R., Epik, I. P.

TITLE: Solution of various three-dimensional problems of radiant
heat transfer by reducing them to two-dimensional problems

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, v. 4, no. 6, 1961, 90-100

TEXT: A method is brought to calculate the degree of blackness for radiating volumes of infinite cylindrical systems. Various of the results reported are used for the critical analysis of the approximation method, which is described here. In connection with the development of modern heat engineering many papers have been published, which deal with the heat transfer by radiation between a medium of high temperature and the bounding walls. A significant success has been gained in the research of the physical properties of radiating media and a number of experimental data has been obtained, which are necessary for calculations. Determining the degree of blackness of a radiating volume is quite a different problem: To the present it only has been possible to find the respective formulas

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S/170/61/004/006/008/015
B129/B212

Solution of various...

for two cases analytically (by integration); for the volume of a sphere by Nusselt (VDI, v. 70, n. 23, 1926) and for the radiation at the center of a cylinder base by Schmidt (VDI, v. 77, n. 43, 1933). The generally known equation of the plane parallel layer is only a special case of the above formulas. So far, all other attempts to calculate the degree of blackness lead to a numerical or graphical integration of the initial expressions. Therefore, the approximate method of determining the degree of blackness of a medium, which is based on reducing the three dimensional to two-dimensional problems is now widely employed. It makes it possible to express the degree of blackness by an exponential function. The simplicity of the formulas obtained is very advantageous, but the "effective layer thickness" has to be considered, which is a completely conditional quantity. Since the rules for the selection of the latter are only based on the above two expressions and some results of the numerical integration it is impossible to check the correctness of the calculated results or the estimation of the probable error for other cases. This article tries to close this gap by pointing to the analytical method of solving problems for infinitely long cylindrical systems. The author brings an analytical

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method of reducing a three-dimensional problem into a two dimensional one in order to determine the degree of blackness for radiating volumes of infinitely long cylindrical systems. The following assumptions are made: 1) The system investigated corresponds to that of Fig. 1; 2) the medium between the areas F_1 and F_2 will radiate onto the element dF_1 ; 3) the medium is isothermal and homogeneous; 4) monochromatic or gray emission takes place according the Bugar law. The reduction to the two-dimensional problem is done through the integral

$$M = \int_{-\pi/2}^{+\pi/2} \exp(-k\eta/\cos\psi) \cos^2\psi d\psi = 2 \int_0^{\pi/2} \exp(-k\eta/\cos\psi) \cos^2\psi d\psi.$$

It is shown that the heat transfer problem ends up in the integration of

$$J = \int_{-\pi/2}^{\pi/2} M(\xi) \cos\psi d\psi \quad (9), \text{ where } \xi = k\eta. \text{ Integrating (9) determines } \xi$$

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B129/B212

Solution of various...

as function of φ . For $\eta = R = \text{const}$ the following expression holds for the degree of blackness: $\xi = 1 - \frac{2}{\pi} M(kR)$. The degrees of blackness are determined for simple geometrical systems (Fig. 5). The results are compiled in Table 2. There are 5 figures, 2 tables, and 8 references: 5 Soviet-bloc and 3 non-Soviet-bloc.

ASSOCIATION: Politekhniicheskiy institut Tallin (Polytechnical Institute Tallin)

SUBMITTED: February 8, 1960

Card 4/8

EPIK, I.P., kand.tekhn.nauk; REZNIK, V.I., inzh.

Selecting the thermal circuit and component layout of high-capacity boiler units fired with Estonian shale taking into account the characteristics of the mineral part of the fuel. Energomashinostroenie 7 no.12:5-9 D '61. (MIRA 14:12)
(Boilers--Design and construction) (Estonia--Shale)

EPIK, I.P., kand.tekhn.nauk; OTS, A.A., kand.tekhn.nauk; MIKK, I.R., kand.-
tekhn.nauk

Distribution of the burner radiation intensity through the width of
the furnace walls. Teploenergetika 8 no.12:43-45 D '61.
(MIRA 14:12)

1. Tallinskiy politekhnicheskii institut.
(Boilers)

EPIK, I.P., kand.tekhn.nauk,dotsent; OTS, A.A., kand.tekhn.nauk, dotsent

Clogging factor of a furnace operating on pulverized shale.
Izv.vys.ucheb.zav.; energ. 5 no. 8:50-55 Ag '62. (MIRA 17:7)

1. Tallinskiy politekhnicheskii institut. Predstavlena kafedroy
teploenergetiki.

EPIK, I. P., kand. tekhn. nauk; OTS, A. A., kand. tekhn. nauk

Distribution of the intensity of the radiation of a torch
along the height of furnace walls. Teploenergetika 10 no.3:
51-53 Mr '63. (MIRA 16:4) ,

1. Tallinskiy politekhnicheskii institut.

(Boilers) (Heat—Transmission)

EPIK, I. [Opik, I.], kand. tekhn. nauk; OTS, A., kand. tekhn. nauk

Measuring the radiation intensity of a flame with radiometers designed for nonsteady-state thermal conditions [with summary in English]. Izv. AN Est. SSR, Ser. fiz.-mat. i tekhn. nauk 12 no.1:75-80 '63. (MIRA 16:5)

1. Tallinn Polytechnical Institute
(Flame) (Radiometry)

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EPIK, I.P., doktor tekhn. nauk, prof.; TAAL', Kh.P., inzh. [Taal, H.]

Study of the volatilization of shale ash in a reducing medium
at high temperatures. Izv. vys. ucheb. zav.; energ. 7 no.6:70-75
Je '64

1. Tallinskiy politekhnicheskiy institut. Predstavlena kafedry
teploenergetiki.

L 39693-66 EWT'(m)/ENP(t)/ETI IJP(c) JD/WB/GD-2

ACC NR: AP6009727

SOURCE CODE: UR/0114/66/000/003/0034/0035

AUTHOR: Epik, I. P. (Doctor of technical sciences, Professor); Tomann, E. L. 13
(Engineer) B

ORG: none

TITLE: Corrosion of 1Kh18N9T steel in air and in flue gases in the presence of shale ashes

SOURCE: Energomashinostroyeniye, no. 3, 1966, 34-35

TOPIC TAGS: steel corrosion, gas corrosion

ABSTRACT: The required test atmosphere was produced in a laboratory by burning shale domestic gas with an admixture of sulfur dioxide and air. These findings are reported: (1) The 1Kh18N9T steel in air at temperatures below 650C practically does not suffer corrosion; (2) In the above flue-gas atmosphere, the corrosion is very low (at 600C, the corrosion loss was 6.1 g/m² after 120 hrs); (3) The corrosion loss of the steel in the flue gases equals that of steel plates buried in shale ashes in the presence of air. Orig. art. has: 1 figure.

SUB CODE: 11, 13 / SUBM DATE: none / ORIG REF: 002

Card 1/1 *gd*

UDC: 620.193.5:669.15

S/021/62/000/006/013/013
D251/D308

AUTHOR: Epik, O.P.

TITLE: First seminar in the Viddil technichnykh nauk AN URSR
(Department of Technical Sciences of the AS UkrSSR) on
the surface diffusion saturation of metals and coatings
of refractory compounds on metals and non-metals

PERIODICAL: Akademiya nauk Ukrayins'koyi RSR. Dopovidi, no. 6,
1962, 837 - 839

TEXT: This is an account of the first seminar on surface diffusion
saturation of metals and coatings of refractory substances on me-
tals and non-metals. The seminar was organized by the VTN of the
AS UkrSSR and the Odes'kyy politekhnichnyy instytut (Odessa Poly-
technic Institute) and held in Kiyev, March 22-23, 1962. More than
80 specialists from all parts of the USSR took part. The opening
speech, devoted to general aspects of the problem, was given by H.V.
Samsonov, Head of the VTN AS UkrSSR and Corresponding Member of the
Academy. H.V. Zemskov (Odessa Polytechnic Institute) read two papers
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First seminar in the Viddil technichnykh..D251/D308

on methods of intensifying chemico-thermal processes with the use of high-frequency currents and also on a proposed series of experiments on multi-component diffusion on alloy surfaces. H.M. Dubinin of the Moskovs'kyy aviatsiynnyy instytut (Moscow Aviation Institute) spoke on complex alloying using a base of molybdenum and niobium and the study of the remaining stress which is induced by the saturation of metal alloy surfaces. Yu.M. Hryboyedov of the Tsentral'nyy naukovodoslidnyy instytut tekhnolohiyi mashynobuduvannya (Central Scientific Research Institute of Machine Construction Technology), Moscow, spoke on nitrification processes. O.P. Epik of the Instytut metalokeramiky i spetsstplaviv AN URSSR (Institute of Metal Ceramics and Special Alloys of the AS UkrSSR) made a study of the diffusion parameters in the borification and carbonification of solid-phase tungsten and molybdenum. V.M. Konyev of the Ural's'kiy universytet (Ural State University) in Sverdlovs'k, spoke on the work of his university in the field of diffusion coatings on metals. L.V. Strashyns'ka of the Institute of Metal Ceramics and Special Alloys of the AS UkrSSR spoke of contact interactions in the solid phase at high temperatures. O.Ya. Artamonov of the same Institute spoke of electroerosive cleansing processes for solid surfaces. I.M. Rovyns'kyi of

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S/021/62/000/006/013/013

First seminar in the Viddil technichnykh..D251/D308

the Doslidnyy zavod derzhplanu URSR (Research Plant of the State Plan of the UkrSSR) spoke on the thermochemical processing of steel and alloys in liquid high-temperature electrolytes. M.H. Faydash of the Odessa Polytechnic Institute spoke on the borification of steel under a vacuum in a solid-phase bath. Each paper was followed by a discussion. The importance of continuing such seminars and of carrying out deeper experimental and theoretical research in this field and of arranging a greater dissemination and interchange of results between researchers was stressed.

✓

Card 3/3

ACCESSION NR: AP4010060

S/0021/64/000/001/0067/0070

AUTHOR: Samonov, G. V. (Corresponding member); Epik, O. P.

TITLE: The reactive diffusion of boron and carbon in refractory transition metals

SOURCE: AN UkrRSR, Dopovid, no. 1, 1964, 67-70

TOPIC TAGS: transition metal, diffusion, refractory, reactive diffusion, phase composition, carbide, boride, activation energy, diffusion parameter, quantum number, Ti, Zr, Nb, Ta, Mo, W, C, B, physical metallurgy

ABSTRACT: This paper deals with an investigation of the effect of the conditions of boration and carbidization of titanium, zirconium, molybdenum and tungsten and of boration of niobium and tantalum on the structure, phase composition and thickness of diffusive carbide and boride coatings. The diffusion parameters of boron and carbon in these metals were determined by the results of metallographic, x-ray and chemical investigations, as well as by measurements of the thickness and microhardness of the diffusion layers. The previously established dependence between the criterion of acceptor capacity of the d-electron shell of metal atoms $1/N_n$ (n is the number of electrons in the d-shell, N the principal quantum number)

Cord 1/2

ACCESSION NR: AP4010060

and the magnitude of the activation energy is confirmed. Orig. art. has 3 figures and 2 tables.

ASSOCIATION: Insty*tut metalokeramiky* 1 spetssplaviv AN UkrRSR (Institute of Metal Ceramics and Special Alloys, AN UkrRSR)

SUBMITTED: 19Apr63

DATE ACQ: 10Feb64

ENCL: 00

SUB CODE: ML, PH

NO REF SOV: 010

OTHER: 000

Cord 2/2

1ST AND 2ND SUBJECT		PROCESS AND PROPERTIES INDEX	
Co		7	
<p>Determination of aluminum in ferroalloy and in "ferroalloy". P. A. Roik and E. G. Remesnikova. <i>J. Applied Chem. (U. S. S. R.)</i> 9, 2085-86 (in French 2006) (1936). — The approx. compn. of "ferroalloy" is: Fe 82, Si 10, C 0.6, Mn 0.5, S 0.03, P 0.04%; like ferroalloy, it contains small amts. of other elements (Al, Ca, Cr and Cu). The sample must be dissolved in HNO₃ or H₂SO₄ in the presence of HF. Fe must be sepd. by the electrolytic method, on the Hg cathode. The acidity of the soln. during electrolysis must not exceed 0.4 N. After sepn. of Fe, Al may be pptd. as Al(OH)₃ with NH₄OH or as phosphate with phosphate salts. The analysis requires 5-6 hrs. Nine references. A. A. Podavny</p>			
<p>ASB-55A METALLURGICAL LITERATURE CLASSIFICATION</p>			

1ST AND 2ND YEARS		3RD AND 4TH YEARS	
PROCESSES AND PROPERTIES INDEX			
CA		2	
<p>Effect of hydrolysis of salts on their solubility. P. A. Podgorny. <i>Applied Chem. (U.S.S.R.)</i> 12, 776-62 (1939). Potentiometric titration (C. A. 20, 7180). A. A. Podgorny</p>			
<p>ASD-11A METALLURGICAL LITERATURE CLASSIFICATION</p>			
10000 HLT ONV 001		10000 HLT ONV 001	
10000 HLT ONV 001		10000 HLT ONV 001	

117 AND 118 RESEARCH PROCESSING AND PROPERTY MODES

2

CA

Schedule of entry in table. F. A. Bick. *J. Applied Chem. (U. S. S. R.)* 18, 857-88 (1960). The method of entry, the entry of ppts. proposed by A. K. Bick (U. S. S. R. 1960) is very convenient for the entry of ppts. (with a few exceptions), but the formulas proposed by Tammov (U. S. S. R. 1960) are wrong and cannot be used for any purpose. Another general method for the same purpose is proposed. A. A. Podgorov

ASSOCIATE METALLURGICAL LITERATURE CLASSIFICATION

FROM SOURCE

117 AND 118 RESEARCH PROCESSING AND PROPERTY MODES

EPik, P. A.

Epik, P. A. and Orochko, A. I. "The solubility of mercury sulfide in bromides and chlorides," *Izvestiya kiyevsk. politekh. in-ta*, Vol VIII, 1948 (on cover: 1949), p. 167

SO: U-5241, 17 December 1953, (Letopis 'Zhurnal 'nykh Statey, No. 24, 1949)

EPIK, P. A.

Epik, P. A. and Tolstikov, V. P. "The effect of pH-characteristic of the media on the oxidation reaction of sulfites by chlorates," Izvestiya Kiyevsk. politekhn. in-ta, Vol. III, 1948 (on cover 1949), p. 168-69

SO: U-5241, 17 December 1953, (Letopis 'zhurnal 'nykh Statey, No. 26, 1949)

EPIK, P. A.

Epik, P. A. "Chemical equilibrium constants of some complex reaction" Izvestiya Kiyevsk. politekhn. in-ta, Vol VIII, 1948 (on cover: 1949), p. 170-71

SO: U-5241, December 1953, (Letopis 'Zhurnal 'nykh Statey, No. 26, 1949)

ca

Influence of the pH of the medium on some oxidation-reduction reactions. P. A. Epik and V. P. Tobolsky (Kiev Polytech. Inst.). *Zhur. Obshchei Khim. (J. Gen. Chem.)* 20, 762-9 (1950). The rate of the oxidation of K_2AsO_4 by $KBrO_3$ was investigated at 15°, in soln. approx. 0.1 N in each reactant, at different concns. of HCl. No reaction occurs at pH > 4; it becomes noticeable with HCl 0.05 N, and increases rapidly with increasing concn. of HCl (0.1, 0.2, and 0.3 N). The kinetic curves are distinctly autocatalytic, with an initial induction period, a self-acceleration branch, and eventual slowing-down. In the acid medium, the reaction is evidently represented by $3H_2AsO_4^- + BrO_3^- \rightarrow 3H_2AsO_4 + Br^-$. That the accelerating factor is the Br^- ion, is demonstrated by the fact that advance introduction of KBr (0.01 M) suppresses both the induction period and the acceleration; K_2AsO_4 has no such effect. The effect of Br^- is accounted for by splitting the overall reaction into the consecutive steps $H_2AsO_4 + BrO_3^- + H^+ \rightarrow HAsO_4 + H_2O + BrO_2$ and $HAsO_4 + BrO_2 \rightarrow H_2AsO_4 + BrO_3^- + H^+$. In H_2SO_4 , the rate shows a similar dependence on the pH as in HCl, only the reaction is somewhat slower, at equal H^+ ion activity. The oxidation of K_2AsO_4 by $KClO_4$ requires a HCl concn.

at least as high as 2 N; the rate increases with the activity (3 and 4 N HCl), and there is no autocatalysis. Oxidation of Na_2SO_3 by $KClO_4$ in soln. 0.1 N in each reactant, at 15°, remains unobservable for 7 hrs. with HCl 0.025 N; with HCl 0.05 N, there is an induction period of 20-40 min., followed by acceleration and eventual slowing-down. The length of the induction period increases with the concn. of Na_2SO_3 . The rate increases sharply with further inc. of HCl (0.075, 0.1, and 1 N). It is noteworthy that, though the oxidation proceeds smoothly in HCl 0.05 N (after the induction period), it does not take place within 24 hrs. in a soln. buffered by NaH_2PO_4 to the same pH of 4.3. The induction period is interpreted by the accumulation of H^+ ions according to $ClO_4^- + H_2SO_3 \rightarrow Cl^- + 2SO_3^{2-} + 2H^+$, possibly also by the side reaction $Cl_2 + 2H_2SO_3 \rightarrow 2SO_4^{2-} + 2H^+$ owing to traces of air (despite exclusion of air). In an initially sufficiently acid soln., 0.075 N in HCl and above, there is no induction period, and the rate increases with the pH increases the rate of oxidation only slightly. The pH dependence of the rates of the above reactions can be interpreted on the basis of a catalytic action of H^+ ions consisting in a deformation of the BrO_3^- and ClO_4^- anions. N. Thon

USSR/ Chemistry - Oxidation reaction

Card 1/1 Pub. 22 - 27/54

Authors : Epik, P. A., and Shub, N. S.

Title : Frontal course of arsenite oxidation reaction with iodate

Periodical : Dok. AN SSSR 100/3, 503-506, Jan 21, 1955

Abstract : Experimental data are presented regarding the frontal course, mechanism, autocatalysis and origin of the arsenite oxidation reaction with iodate. In the part of the solution through which the reaction front has already passed the oxidation reaction was observed to continue until its termination and was very insignificant in the remaining parts. When the reaction front originates elsewhere than on the surface of the solution it was seen suddenly shifted upwards (in the reactor) with a speed of 80-169 mm/min. Four USSR references (1906-1952). Illustrations.

Institution : The Polytechnicum, Kiev

Presented by : Academician A. N. Frumkin, November 23, 1954

EPIK, P.A., dots., kand. khim. nauk; OROCHKO, A.I., assistant

New method for determining iodate and bromate from their mixture.
Izv. KPI 20:90-94 '57. (MIRA 11:3)
(Iodates) (Bromates)

EPIK, P.A., dots., kand.khim.nauk; SHUB, N.S., kand.khim.nauk

Iodine determination in the presence of bromides and chlorides.

Inv. KPI 20:95-99 '57.

(MIRA 11:3)

(Iodides) (Bromides) (Chlorides)

МПИК. Р.А., dots., kand.khim.nauk

Frontal reaction pattern of sulfite iodate oxidation. Izv. KPI
20:100-107 '57. (MIRA 11:3)
(Sulfites) (Oxidation) (Iodates)

AUTHORS: Epik, P. A., Orochko, A. I. SOV/78-3-8-23/48

TITLE: The Dependence of the Stability of Some Oxygen Containing Inorganic Compounds on the pH-Value of the Medium (Zavisimost' ustoychivosti nekotorykh kislorodsoderzhashchikh neorganicheskikh soyedineniy ot pH sredy)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol. 3, Nr 8, pp. 1855-1864 (USSR)

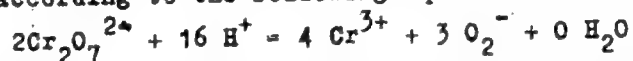
ABSTRACT: The resistance of the oxidizing agents KClO_3 , KBrO_3 , KJO_3 , $\text{K}_2\text{Cr}_2\text{O}_7$, KMnO_4 , NaClO_2 and NaClO to the action of sulfuric acid in aqueous solution was investigated. The results show that on certain conditions some of these oxygen containing oxidizing agents completely decompose, and that others in the same case remain unchanged. The deformation and decomposition of the oxygen containing oxidizing agents is due to the catalysis of hydrogen ions. The decomposition rate of KMnO_4 in acid medium increases with the increase of the acid concentration. The decomposition rate of potassium permanganate does not take place monotonously. With the increase of the normality of the acid to 23 N the de-

Card 1/3

SOV/78-3-8-23/48

The Dependence of the Stability of Some Oxygen Containing Inorganic Compounds on the pH-Value of the Medium

composition rate increases, on a further increase of the concentration to 30 N it decreases, and on another increase of the concentration it increases again. The investigation of the stability of potassium bichromate shows that the decomposition of this oxidizing agent under the action of sulfuric acid takes place according to the following equation:



The decomposition rate of this reaction was investigated in 16,5-, 19,8-, 23,1- and 33,2 N-sulfuric acid solutions. The results obtained show that at room temperature potassium bichromate is relatively resistant to the action of sulfuric acid. The stability of the oxidizing agents at boiling temperatures was investigated. The oxygen containing oxidizing agents with regard to their resistance to sulfuric acid must be classified as follows: KJO_3 , $\text{K}_2\text{Cr}_2\text{O}_7$, KClO_3 , KBrO_3 , NaClO and NaClO_2 . Potassium permanganate does not take any fixed place among these oxidizing agents.

Card 2/3

SOV/78-3-8-23/48

The Dependence of the Stability of Some Oxygen Containing Inorganic Compounds
on the pH-Value of the Medium

Based on the results obtained on the resistance of the oxidizing
agents mentioned above to the action of sulfuric acid the quali-
tative analysis of certain mixtures of these oxidizing agents
can be carried out.

There are 9 figures and 22 references, 17 of which are Soviet.

ASSOCIATION: Kiyevskiy politekhnicheskoy institut (Kiyev Polytechnical
Institute)

SUBMITTED: July 8, 1957

Card 3/3

AUTHORS: Epik, P.A., Orochko, A.I. 32-24-4-12/67

TITLE: The Determination of Chlorites and Hypochlorites in Their Mixture (Opredeleniye khloritov i gipokhloritov v ikh smesi)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 4, pp. 413-415 (USSR)

ABSTRACT: As determinations with arsenic- and platinum preparations cause certain difficulties, the endeavor was made to find other reducing substances for these investigations. Experiments were made with bivalent cations of cobalt, nickel, and manganese, as well as with hydrogen peroxide, in which mixtures of pure chlorite and hypochlorite were used as 0.1 - 0.2n solutions. Experimental results for cobalt (II) and nickel (II) ions showed that they are unsuited for the required determination. When evaluating the influence exercised by the alkaline medium upon the course of the reduction of hypochlorite by manganese (II) it was found that the interval $8.2 < \text{pH} < 10.2$ must be considered an optimum for the reduction of hypochlorite beside chlorite. Hydrogen peroxide was used with an alkalinity of 0.2 - 0.5n lye, which was found to be

Card 1/2

The Determination of Chlorites and Hypochlorites
in Their Mixture

32-24-4-12/67

an optimum. As a buffer solution in the case of manganese (II) sodium bicarbonate or Na_2HPO_4 was used, but the latter slowed down filtration. The suggested volumetric methods of determination can also be used for separating chlorite from hypochlorite and for a quality reaction on chlorite beside hypochlorite. There are 2 figures, 2 tables, and 2 references, 2 of which are Soviet.

ASSOCIATION: Kiyevskiy politekhnicheskii institut (Kiyev Polytechnic Institute)

1. Chlorates--Determination
2. Cobalt ions--Chemical effects
3. Nickel ions--Chemical effects
4. Hydrogen peroxide
--Chemical effects

Card 2/2

5.5200
5.3200
5-27

67032

AUTHORS:

Epik, P. A., Tolstikov, V. P.

SOV/153-2-5-5/31

TITLE:

Selective Iodometric Determination of Oxidizers

PERIODICAL:

Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1959, Vol 2, Nr 5, pp 667-673 (USSR)

ABSTRACT:

The rate and conversion degree of many redox reactions can be influenced at a high degree, or even prevented, by adjustment of the pH-values. As the corresponding zones of the pH-values of different reactions can be distinguished, the oxidizers can often be determined by selectivity. To establish these new methods of determination, a systematic study of the dependence of kinetics of many redox reactions on the pH becomes necessary. The authors carried out the study of the oxidation of the iodide (Ref 6). The present paper reports on a similar study in which arsenite was used as a reducing agent. The data published by various researchers on the dependence of the oxidation of the arsenite on the pH-value (Refs 4, 8-16), are difficult to compare. The authors wanted to study this dependence by applying various oxidizers. This is necessary - while the other conditions are constant - for the elaboration of the arsenite-iodometric determination of several of these oxidizers.

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SOV/153-2-5-5/31

Selective Iodometric Determination of Oxidizers

Arsenite can be rapidly and accurately titrated at $7 < \text{pH} < 11$. Figure 1 lists materials used as buffer solutions for keeping the above pH-range. 18 oxidizers were studied: nitrite, nitrate, vanadate, arsenate, antimonate, selenite, selenate, tellurite, tellurate, molybdate, chlorate, bichromate, hypochlorite, chlorite, bromate, iodate, periodate and permanganate. The experiment showed that the first 11 of the listed oxidizers were practically not reduced by the arsenite in the pH-range between 0 and 14 within the first 10 minutes. Permanganate is reducible at practically all pH-values, but no reproducible results were obtained. In each case a mixture of manganese compounds is being formed, each having a different valency. Tables 2 and 3 show that the remaining oxidizers react with arsenite depending on the pH and Δt (time elapsed between preparation of the reaction mixture and the start of the titration). Subsequently, several peculiarities of these reactions are mentioned. Table 3 gives the results of the determination of periodate. A figure (p 671) illustrates all of the results. The selective determination of several oxidizers containing oxygen is dealt with separately. Table 4 shows the determination of chromate in the presence of

Card 2/3

Selective Iodometric Determination of Oxidizers

67032

SOV/153-2-5-5/31

arsenate, antimonate and selenite; table 5 the determination of hypochlorite. The results give a review of the possibility of carrying out the determination mentioned in the title, and the conditions necessary for this. The practicability of the following selective iodometric determinations was confirmed: of chromate in the presence of arsenate, antimonate, selenite and molybdate (used separately); of hypochlorite in the presence of chromate; of bromate in the presence of vanadate. In most of the binary mixtures of oxidizers, both oxidizers can be determined by additional titration if the acidity of the medium is correct. There are 1 figure, 5 tables, and 18 references, 10 of which are Soviet.

ASSOCIATION: Kiyevskiy politekhnicheskoy institut; Kafedra analiticheskoy khimii (Kiev Polytechnic Institute, Chair of Analytical Chemistry) ✓

SUBMITTED: June 21, 1958

Card 3/3

EPIK, P. A.; PERCHIK, F. I.

Oxidation reactions of ferrocyanide by some oxidizing agents
as dependent on pH of the medium. Izv. vys. ucheb. zav.;
khim. i khim. tekhn. 5 no.5:703-708 '62.

(MIRA 16:1)

1. Kiyevskiy politekhnicheskoy institut, kafedra analiticheskoy
khimii.

(Ferrocyanides) (Oxidation)
(Hydrogen-ion concentration)

KONKIN, Vasil'y Dmitriyevich; ZHIKHAREVA, Valentina Iosifovna;
EPIK, P.A., kand. tekhn. nauk, retsenzent;

[Complexometric analysis] Kompleksometricheskii analiz.
Izd.2., perer. i dop. Kiev, "Tekhnika," 1964. 255 p.
(MIRA 17:6)

EPIK, P.A.; TOLSTIKOV, V.P.

Frontal progress of the oxidation reaction of sulfite with
chlorate. Zhur. fiz. khim. 39 no.4:947-950 Ap '65.

(MIRA 19:1)

1. Kiyevskiy politekhnicheskii institut. Submitted Dec. 14, 1963.

DAVTYAN, O.K.; Primali uchastiye: EPIMAKHOV, Yu.K.; MISYUK, E.G.;
BURSHTEYN, I.I.; SEMIZOROVA, N.F.

Mechanism of oxidation, hydrogenation, and electrochemical
combustion on solid catalysts. Part 12. Zhur. fiz. khim. 39
no.4:877-883 Ap '65. (MIRA 19:1)

1. Odesskiy gosudarstvennyy universitet imeni Mechnikova.
Submitted Aug. 17, 1963.

EPISKOPOV, G. I.

"Atomic sociology" is an ideological weapon of American imperialism. Moskva, Gos.
izd-vo polit. lit-ry. 1953. 108 p. (54-35432

E744.E6

RAGO, Gerhard, prof.; EPLER, H., spets. red.; TOMING, R., red.; KOHU, H.,
tekh. red.

[Higher mathematics] Kõrgem matemaatika. Tallinn, Eesti riiklik
kirjastus. Vol.1. 1962. 738 p. (MIRA 15:5)

1. Tartu University (for Rago).
(Mathematics)

EPLER, R.

R. Epler, "Bacterial Warfare," Polska Gaz. Lok., 14: 203-5, 1935.

EL'PINER, I. Ye. SHEYNKER, A. P.

"Production of Endotoxin (Of the Culture of bacillus pertussis) by Ultrasonic Waves,"

Byull. eksp. biol. i med., 1947, 7, 51

M-28, 14 Dec 1954

1ST AND 2ND DEGREE		PROCESSES AND PROPERTIES INDEX		3RD AND 4TH DEGREE	
CP				10	
<p>Polarography of pyruvic acid enolization in the presence of amino acids. A. M. Kuzin and I. E. El'piner (Bach Biochem. Inst., Moscow). <i>Biofizika</i> 12, 809-12 (1947); cf. <i>C.A.</i> 20, 1889; 33, 8089; 34, 7956. It had previously been shown that the activity of the carbonyl group is enhanced by the presence of amino acids. The assumption was that the amino acids caused enol formation. This has now been proved polarographically. The addn. of glycine to pyruvic acid, at room temp., causes almost instant enolization. It was accidentally discovered that NaF (but not NaCl, NaBr, NaI) also causes enolization of pyruvic acid. H. Priestley</p>					
ASA-SLA METALLURGICAL LITERATURE CLASSIFICATION					
1900-1949		1950-1959		1960-1969	
1970-1979		1980-1989		1990-1999	

ELPINER, I. E.

PA 5T1

USSR/Medical Science
Polarigraphy
Biology

Feb 1947

"The Polarigraphic Method in Biology and Medicine,"
I. E. Elpiner, 20 pp

"Uspek Sovremen Biolog" Vol XXIII, No 2

Gives 1) description of method, 2) polarigraphic analysis of inorganic substances in biologic tissues, 3) polarigraphic maximums, 4) polarigraphic analysis of biologically active organic substances, 5) polarigraphic catalytic protein waves, 6) catalytic protein waves and symptoms of cancer.

5T1

PA

11-6

Polarographic analysis of the blood proteins in cancer.
H. I. Zbarskii and I. M. Il'piner (Acad. Med., Moscow).
Soviet. Med. Biol. 24, No. 1, 22-5 (1947); cf.
Bridika, C.A. 31, 3148, 6326; 32, 6321; *Acta Union
Intern. Contra Cancerum* 3, 13 (1938).—In confirmation of
previous work it was found that the serums of 20 of 24
patients with cancer gave smaller catalytic waves on
polarography than did the normal controls. Serums of
some patients with other diseases also gave pos. results.
Proteins extd. from the blood of rabbits bearing Brown-
Pearce carcinomas with 0.1 N AcOH gave significantly
higher waves than were found in the controls. The
possible significance of the findings is discussed.
Eugene Roberts

ASB SLA METALLURGICAL LITERATURE CLASSIFICATION

6-2

ELFINER, I. Ye.

PA 3/49T59

USBR/Medicine - Sounds
Medicine - Therapeutics

Mar/Apr 48

"Supersonic Waves in Biology and Medicine," I. Ye. Elfiner, Moscow, 24 pp

"Voproski Sovrem Biol" Vol XIV, No 2

Explains nature of supersonic waves and methods of producing them. Discusses cavitation phenomena. Describes destruction of tissue cells and bacteria by supersonic waves. Shows that such chemical effects as depolymerization may take place in absence of cavitation. Mentions secondary factors - pressure gradient and heat; considers that main biological action of ultrasonic waves is due to

3/49T59

USBR/Medicine - Sounds (Contd)

Mar/Apr 48

Destruction of albuminous component of protoplasm. Quotes I. B. Barsky's views on this subject. Mentions various therapeutic applications of ultrasonic waves.

3/49T59

Is the article, from Ibid., p 161, which is in bibliography of article by I. Ye. Elfiner and I. F. Kolesnikova on "Oxidation and Reduction of Iodine under the action of Ultrasonic Waves," pub. in Dokl. Akad. Nauk SSSR (Moscow Series) Vol. LXXV, No. 3, 1950. Not shown by satellite card for same article - p. 161.

EL'PINER, I. Ye.

"Problem of Variations in Albumin Structure in Cancer," Arkhiv Patol., 11 No 3, 1949. Lab of Biochemistry of Cancer, Acad, Med Sci USSR, Moscow, 1949

EL'PINER, I. E.

Chemical Abst.
Vol. 48 No. 4
Feb. 25, 1954
Biological Chemistry

The coagulation tendency of blood proteins in cancer diagnosis. I. B. Zbarskii and I. E. El'piner (Acad. Med. Sci. U.S.S.R., Moscow). *Ukrain. biokhim. zhur.* 12, 375-383(1960)(in Russian); cf. C.A. 42, 3843b. Factors affecting thermal coagulation of protein, notably pH and protein micellar charge, are pointed out. The thermal coagulation of homogenates from healthy livers and spleens proceeds rapidly (1-5 min.), whereas homogenates from malignant tumors of rats, induced by arc dyes or by subcutaneous injection of methylcholanthrene, do not coagulate even upon prolonged boiling at 200°. In 48 out of 60 human cancer cases there was an increase in the height of the protein polarographic wave for blood filtrates obtained by thermal coagulation of the blood. Evidently there appears in cancerous blood a modified protein, which resists heat coagulation, the presence of which in the filtrate is responsible for an increase in the first of 2 polarographic waves, the 2 waves being characteristic of all proteins. C. P. H.

EL'PINER, I.Ye.

New theory on the biological effect of ultrasonic waves.

Usp. soverm. biol. 30 no.1:113-129 July-Aug. 1950. (CML 20:1)

1. Moscow.

C.A.

2

B. P. Block
Zharskiy, and V. N. Kharlamova. *Doklady Akad. Nauk*
S.S.S.R. 73, 1255-6 (1960).—Subjecting of a no. of amino
acids to action of ultrasound (500 kc. at 8 v./sq. cm.) in
aq. solns. gave the following results: Aspartic and glu-
tamic acids, alanine, serine, threonine, lysine, and glycine
are unaffected; however, tryptophan, leucine, valine, meth-
ionine, histidine, and tryptophan are gradually decumpos-
ed and in 4 hrs. the latter is totally destroyed; concn. about
0.1% if was used. A 11 atm. retards decumpos. of histi-
dine, tryptophan, and tyrosine. (I. M. Kozlovskiy)

CA

Oxidation and reduction of iodine in supersonic fields.
 I. M. Klyuzne and M. P. Kolesnikova. *Doklady Akad. Nauk S.S.S.R.* 75, 637-6 (1960).—In an aq. soln. of KI, the amt. of I_2 produced by 30-min. action of a supersonic wave of 6×10^5 hertz, intensity at the plate, ~ 6 w./sq. cm., rises with the concn. of the KI up to about 0.5 N, then remains const. with further increasing concn.; the ratio of the amt. of I_2 produced to the amt. of KI present falls with increasing concn. of KI, rapidly at low concns., then slower. Tyrosine exerts a "protective" influence; thus, with 0.5% of it, no I_2 was produced in a 0.5 N KI soln. even after 60-90 min. Oxidation is suppressed completely if the soln. has been previously acid. with H_2O_2 . In such a H_2O_2 -acid. soln., dissolved I_2 is reduced to I^- ; thus, 3.22×10^{-4} g. I_2 in 1 ml. of aq. soln. of 0.5 N KI could be reduced completely, but only in 4 hrs. The reduction evidently takes place in cavities into which the dissolved I_2 and I^- diffuse; I_2 and I^- are ionized simultaneously. The primary effect of the supersonic wave is the formation of active species, $OH\cdot$, $H\cdot$, $HO_2\cdot$, H_2O_2 , etc., apparently in the gas bubbles produced by cavitation; these active species penetrate into the soln. upon collapse of the gas bubbles. Formation of active species in the cavities is borne out by observation of the disc. bands produced therein (Levin and Ribevkin, *C.A.B.* 33, 2481; Reuter, *C.A.B.* 36, 7022; Frankel, *C.A.B.* 36, 7022). N. Thon

Translation M-28

1957

14 Dec 54

EL'FINER, I. E.

"Physico-Chemical and Biological Action of Ultrasonics," a paper presented at the conference of the Acoustics Commission NS USSR held in Leningrad 1-3 Feb 51.

W-21610, 25 Feb 52

PA 19524

ELPNER, I. YE.

USSR/Biology - Ultrasonics

Oct 51

"Biological and Chemical Processes in Ultrasonic Fields, I. Ye. Elpiner

"Zhur Tekh Fiz" Vol XXI, No 10, pp 1205-1212

Author refers to his previous works (cf. "Uspekhi Sovrem Biol", 25 (1948) and 30 (1950)). He describes destructive effect of ultrasonics on disease-carrying bacteria and the splitting by ultrasonics of high-mol protein structures and organic mols; explains the mechanism governing the chem effect. Submitted 31 Dec 50.

193T4

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Biological and physicochemical methods in cancer diagnosis. I. H. El'pin. *Lipetskii Sovetskii Biol.* 31, 191-214 (1981).—Radioactive tracer elements, polarography, thermoregulation of serum proteins, mitogenic radiation, and the oxidation-reduction properties of blood serum are reviewed as lines of attack in cancer diagnosis. 113 references.
Julian F. Smith

CA 2

Depolymerization of sodium deoxyribonucleate by ultrasonic waves. I. B. Zbarski, I. E. El'pinner, and V. N. Kharlamova. *Doklady Akad. Nauk S.S.S.R.* 77, 439-41 (1951).—The impact of ultrasonic vibrations (600,000 cycles) on 0.3% aq. solns. of Na deoxyribonucleate leads to a smooth and rapid drop of viscosity to 0 after 25-120 min. (depending on the amplitude of the waves). A brief exposure leads to distinct departure from the Poiseuille law, i.e. showing structural viscosity. The depolymerization occurs even in the presence of iodine, which is a known "absorber" of ultrasonic waves. The pH of the soln. remains const. (6.4-6.6). After 8 hrs. of exposure a weak test for NH₂ appears. G. M. Koudachoff

USSR/Chemistry - Blood; Effects of 21 Jul 51
Ultrasound

"Splitting of Porphyrin Rings Under the Effect of
Ultrasonic Waves," I. Ye. El'piner, L. A.
Blyumenfel'd, S. E. Krasovitskaya, Gen Inst of
Advanced Trng of Physicians, Min of Pub Health
USSR; Lab of Cancer Biochem, Acad Med Sci USSR

"Dok Ak Nauk SSSR" Vol LXXIX, No 3, pp 495-497

Under action of ultrasonic waves in air the splitting
of hemin is slow. With sufficiently powerful ultra-
sonic waves, the breaking up of hemin proceeds up

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to the appearance of pyrroles, but no noticeable
formation of bile pigments could be observed. It
is concluded that the iron atom apparently plays
the role of a factor which creates a high deg of
stability of the porphyrin nucleus. Data obtained
can be used for evaluating effect of oxygen: in
H₂ atm, splitting of porphyrin by ultrasound does
not occur.

Translation M-28, 14 Dec 64

211725

EL'PINER, I. YE.

Being translated March 1953

GINZBURG, H. M.; YEL'PINA, I. Ye.

Gums - Diseases

Polarographic study of salivary proteins of the parotid gland in alveolar pyorrhea.,
Stomatologia, no. 1, 1952.

9. Monthly List of Russian Accessions, Library of Congress, May ²1953. Unclassified.

EL'PINER, I. Ye.

USSR/Biology, Medicine - Microbiology Mar/Apr 52

"Ultra-Sound Waves in Microbiology," I. Ye. El'-
piner

"Mikrobiol" Vol XXI, No 2, pp 228-238

Reviews USSR and foreign work on the subject,
listing 30 Russian and 24 foreign references.
Giving as an example his own work on the isola-
tion of whooping cough endotoxin, discusses isola-
tion of biologically active substances (toxins,
endotoxins, antigens, etc.) from bacterial cells
with the aid of ultra-sound.

210T18

Translation
M-646
26 June 55

ML'PINER, I. M.

Biologic effect of ionising radiation. Usp. sovrem.
biol. 34 no.2:219-243 Sept-Oct 1952. (OLML 25:5)

1. Moscow.

EL'PINER, I. Ye.

"USSR Work on Application of Ultrasound Waves in Biology," Priroda, 41, No.11,
pp 109-114, 1952

Translation W-27751, 10 Sep 53

Effect of ultrasound waves on hyaluronic and chondroitin-sulfuric acids. I. R. Filinova and S. M. Bychkov. Dokl. Akad. Nauk S.S.S.R. 22, 123 (1952). --Subjection of aq. solns. of hyaluronic acid (I) and chondroitin-sulfuric acid (II) (0.1% and 0.4%, resp.) to ultrasound (500,000 cycles per sec.) caused a steady and rapid decline of viscosity of solns. of I and a rather lower decline in II. The intensity of color test for N-acetylhexosamine increases with exposure. Both solns. show a steadily increasing reducing power (up to 70% in comparison with hydrolytic cleavage of I and 30% of II). Possibly the cleavage occurs between elements of N-acetylhexosamines and glucuronic acid.

G. M. Kosolapoff

Translation M-28

14 Dec 54

EL'PINER, I. YE.

USSR/Chemistry - Medicine, Ultrasound 1 Feb 52

"The Effect of Ultrasound Waves On Purine and Pyrimidine Bases," I. Ye. El'piner, Ts. B. Kays, Lab of Biochem of Cancer, Acad Med Sci USSR

"Dok Ak Nauk SSSR" Vol LXXXII, No 4, pp 611-614

Uracil proved to be more sensitive to ultrasound than adenine or guanine. When ethyl ether, ethyl alc or methyl alc was added to an aq soln contg uracil, by ultrasound was almost completely inhibited. The same protective effect was exerted by these substances on methylene blue. The explanation is that the org solvents evap into the spaces formed by cavitation, thus reducing

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the quantity of chemically active radicals present there which result from the splitting of water mols. Some amino acids which decom themselves (leucine, methionine, etc.) under the action of ultrasound also protect the bases investigated. The bases in question are components of nucleic acids, which are very sensitive to ultrasound.

Translation M-28, 14 Dec 54

213720

EL'PINER, I.Ye.; GHEASIMOVA, A.V.

Effect of ultrasonics on depolymerase of deoxyribonucleic acid.
Doklady Akad. nauk 86 no. 4:797-800 1 Oct 1952. (GLML 23:3)

1. Presented by Academician A. I. Oparin 5 September 1952. 2. Academy of Medical Sciences USSR.

MY PINER, I.E.

USSR.

Garbage phenomena and their significance in history

1. Introduction

2. The problem

3. The problem

4. The problem

5. The problem

6. The problem

7. The problem

8. The problem

9. The problem

10. The problem

11. The problem

12. The problem

13. The problem

EL'PINER, I. (2).

"The Biological Action of Ultrasonic Waves"

Zhur Obsh Biologii, Vol XV, No 1, 1954 pp 18-30

Trans.

M-28, 14 Dec 54

USSR/Biology - Biochemistry

Card : 1/1

Authors : Oparin, A. I. Academician; Gel'man, N. S. and El'piner, I. E.

EL PINER, I. E.

USER/Physics - Biophysics

Card 1/1 Pub. 22 - 15/40

Authors : El'piner, I. E., and Surova, M. D.

Title : Acceleration of albumen decomposition processes in the field of ultrasonic waves

Periodical : Dok. AN SSSR 99/2, 243-246, Nov 11, 1954

Abstract : Experiments show that the decomposition of albumen molecules, observed in the field of ultrasonic waves, can be controlled. The chemical processes originating in the ultrasonic wave field and their causes are discussed. Acceleration or inhibition of albumen decomposition processes was found possible through the addition of some organic substances to the solution exposed to the effect of ultrasonic waves. The presence of CCl_4 in the albumen solution exposed to ultrasonic waves and its effect on the accumulation of reducing substances is explained. Nine references; 8-USSR and 1-USA (1943-1954). Table; graphs.

Institution: Academy of Sciences USSR, Institute of Biological Physics

Presented by: Academician A. I. Oparin, June 28, 1954

Translation M-841, 26 Oct 55

EL'PINER I.E.

USSR/ Biology - Biochemistry

Card 1/1 Pub. 22 - 23/40

Authors : Oparin, A.I., Academician.; Bardinskaya, M.S.; and El'piner, I.E.

Title : Effect of ultrasonic waves on yeast invertase

Periodical : Dok. AN SSSR 99/3, 423-426, Nov 21, 1954

Abstract : The change in the activity of a ferment, after being exposed to ultrasonic waves in an aqueous medium and in the presence of methyl alcohol, was investigated. Experimental data obtained indicate that the effect of ultrasonic waves on the invertase is connected first of all with the reaction of the ferment with the products of water molecule cleavage. The effect of polymannan contents in the albumin-carbohydrate complex of the invertase, on the stability of the ferment, is elucidated. Ten references: 3-USA; 6-USSR and 1-Swiss (1950-1954). Diagrams.

Institution : Academy of Sciences USSR, The A.N. Bakh Institute of Biochemistry and the Institute of Biological Physics

Submitted : June 22, 1954

EL'PINER, I. Ye.

"Mechanism Governing the Biological Action of Ultrasonic Waves".

Institute of Biophysics, Academy of Sciences USSR

A report delivered at a conference on Electro-acoustics held by the Acoustic Commission, the Acoustic Institute of the Academy of Sciences USSR, and Polytechnic Inst., from 1-5 July 1955 in Kiev.

SO: Sum 728, 28 Nov 1955

EL'PINER, I.Ye.; FOGOSYANTS, Ye.Ye.; ZASLAVSKIY, V.G.

Effect of ultrasonic waves on the milk factor. Vop.onk. 1
no.2:42-44 '55. (MLRA 8:10)

1. Iz laboratorii eksperimental'noy onkologii (sav. chl.korr.
AMN SSSR prof. L.M.Shabad) Akademii meditsinskikh nauk SSSR)

(ULTRASONICS, effects,
on milk factor)

(NEOPLASMS, experimental,
milk factor, eff. of ultrasonics)

(BREAST, neoplasms,
milk factor, eff. of ultrasonics)

E.L'PINER, I. Ye.

MEDVEDEVA, G.A.; EL'PINER, I.Ye.

Effect of ultrasonic waves on yeast cells. Zhur.obshch. biol.
16 no.4:315-320 J1-Ag '55. (MLRA 8:11)

1. Institut mikrobiologii, Institut biofiziki AN SSSR.
(ULTRASONIC WAVES, effects,
on yeast.)
(YEAST, effect of radiations,
ultraviolet rays)

EL'PINER, I. Ye. doktor biologicheskikh nauk

Ultrasonic waves in biology. Nauka i zhizn' 22 no.7:14-16 J1 '55.
(Ultrasonic waves) (MIRA 8:9)